

What is claimed is:

1. Crystalline sodium (2S,3S)-3-[[ (1S)-1-iso-  
5 butoxymethyl-3-methylbutyl] carbamoyl] oxirane-2-carboxyl-  
ate having the following characteristics:

DSC: exothermic peak observed at a temperature in  
the range of 170 to 175°C with weight decrease; and

characteristic absorption bands of infrared absorp-  
10 tion spectrum measured on KBr tablet: 3255, 2950, 2860,  
1670, 1630, 1550, 1460, 1435, 1395, 1365, 1310, 1260,  
1110, 890  $\text{cm}^{-1}$ .

2. Crystalline potassium (2S,3S)-3-[[ (1S)-1-iso-  
15 butoxymethyl-3-methylbutyl] carbamoyl] oxirane-2-carboxyl-  
ate having the following characteristics:

DSC: exothermic peak observed at 177°C with weight  
decrease; and

characteristic absorption bands of infrared absorp-  
20 tion spectrum measured on KBr tablet: 3270, 3080, 2950,  
2870, 1680, 1625, 1560, 1460, 1380, 1300, 1240, 1110, 895  
 $\text{cm}^{-1}$ .

3. A process for preparation of crystalline sodium  
25 or potassium (2S,3S)-3-[[ (1S)-1-isobutoxymethyl-3-methyl-  
butyl] carbamoyl] oxirane-2-carboxylate, comprising the  
following steps (1) to (6):

(1) hydrolyzing an ester of (2S,3S)-3-[[ (1S)-1-  
isobutoxymethyl-3-methylbutyl] carbamoyl] oxirane-2-carbox-  
30 ylic acid, to obtain (2S,3S)-3-[[ (1S)-1-isobutoxymethyl-  
3-methylbutyl] carbamoyl] oxirane-2-carboxylic acid,

(2) causing the carboxylic acid obtained in the pre-  
ceding step react with an organic amine, to prepare a  
salt of (2S,3S)-3-[[ (1S)-1-isobutoxymethyl-3-methyl-  
35 butyl] carbamoyl] oxirane-2-carboxylic acid with the organ-  
ic amine,

(3) adding an acid to the salt obtained in the preceding step, to obtain (2S,3S)-3-[[ (1S)-1-isobutoxymethyl-3-methylbutyl]carbamoyl]oxirane-2-carboxylic acid,

5 (4) causing the carboxylic acid obtained in the preceding step react with a basic sodium or potassium compound in a mixed solvent of water and an aliphatic alcohol or acetone, to obtain a sodium or potassium salt,

(5) recrystallizing the sodium or potassium salt obtained in the preceding step using an aliphatic alcohol, and

(6) drying the product recrystallized in the preceding step under reduced pressure.

4. A process for preparation of crystalline sodium or potassium (2S,3S)-3-[[ (1S)-1-isobutoxymethyl-3-methylbutyl]carbamoyl]oxirane-2-carboxylate, comprising the following steps (1) to (4):

15 (1) causing an ester of (2S,3S)-3-[[ (1S)-1-isobutoxymethyl-3-methylbutyl]carbamoyl]oxirane-2-carboxylic acid react with a basic sodium or potassium compound, to obtain sodium or potassium (2S,3S)-3-[[ (1S)-1-isobutoxymethyl-3-methylbutyl]carbamoyl]oxirane-2-carboxylate,

20 (2) crystallizing the sodium or potassium salt obtained in the preceding step from a mixed solvent of water and acetone, to obtain crystalline sodium or potassium salt,

(3) recrystallizing the sodium or potassium salt obtained in the preceding step using an aliphatic alcohol, and

30 (4) drying the product recrystallized in the preceding step under reduced pressure.

5. A salt of (2S,3S)-3-[[ (1S)-1-isobutoxymethyl-3-methylbutyl]carbamoyl]oxirane-2-carboxylic acid with an organic amine.

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6. A salt of (2S,3S)-3-[[[(1S)-1-isobutoxymethyl-3-methylbutyl]carbamoyl]oxirane-2-carboxylic acid with an organic amine represented by the formula of:



in which  $R^1$  is hydrogen or a linear-chain, branched-chain or cyclic alkyl group having 1 to 10 carbon atoms;  $R^2$  is hydrogen or a linear-chain, branched-chain or cyclic  
10 ~~alkyl or aralkyl group of 1 to 10 carbon atoms; and  $R^3$  is~~  
a linear-chain, branched-chain or cyclic alkyl group having 1 to 10 carbon atoms which may have a substituent selected from the group consisting of halogen atoms, nitro, hydroxyl, carboxyl, guanidino, amino and aralkyl-  
15 amino groups; or otherwise  $R^2$  and  $R^3$  can be combined to form a 5- to 7-membered ring comprising the nitrogen atom to which  $R^2$  and  $R^3$  are connected, the ring possibly containing additional nitrogen atom.

20 7. A salt of (2S,3S)-3-[[[(1S)-1-isobutoxymethyl-3-methylbutyl]carbamoyl]oxirane-2-carboxylic acid with an organic amine selected from the group consisting of piperazine, adamantane amines, cyclohexylamine, dicyclohexylamine, tris(hydroxymethyl)aminomethane, arginine,  
25 lysine, benzathine, and meglumine.